SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT301- COMMUNICATION NETWORKS

III YEAR/ V SEMESTER

UNIT 1 – INTRODUCTION TO NETWORKS AND LAYERED ARCHITECTURE

TOPIC –CIRCUIT SWITCHING

OVERVIEW

- Networks are used to interconnect many devices.
- We have checked with Local Area Networks.
- Now, wide area networks
  - Since the invention of the telephone, **circuit switching** has been the dominant technology for voice communications.

SWITCHED COMMUNICATIONS NETWORKS

- Long distance transmission between stations (called "end devices") is typically done over a network of **switching nodes.**

- Switching nodes do not concern with content of data. Their purpose is to provide a switching facility that will move the data from node to node until they reach their destination (the end device).

- A collection of nodes and connections forms a communications network.

- In a switched communications network, data entering the network from a station are **routed** to the destination by being switched from node to node.

SIMPLE SWITCHING NETWORK
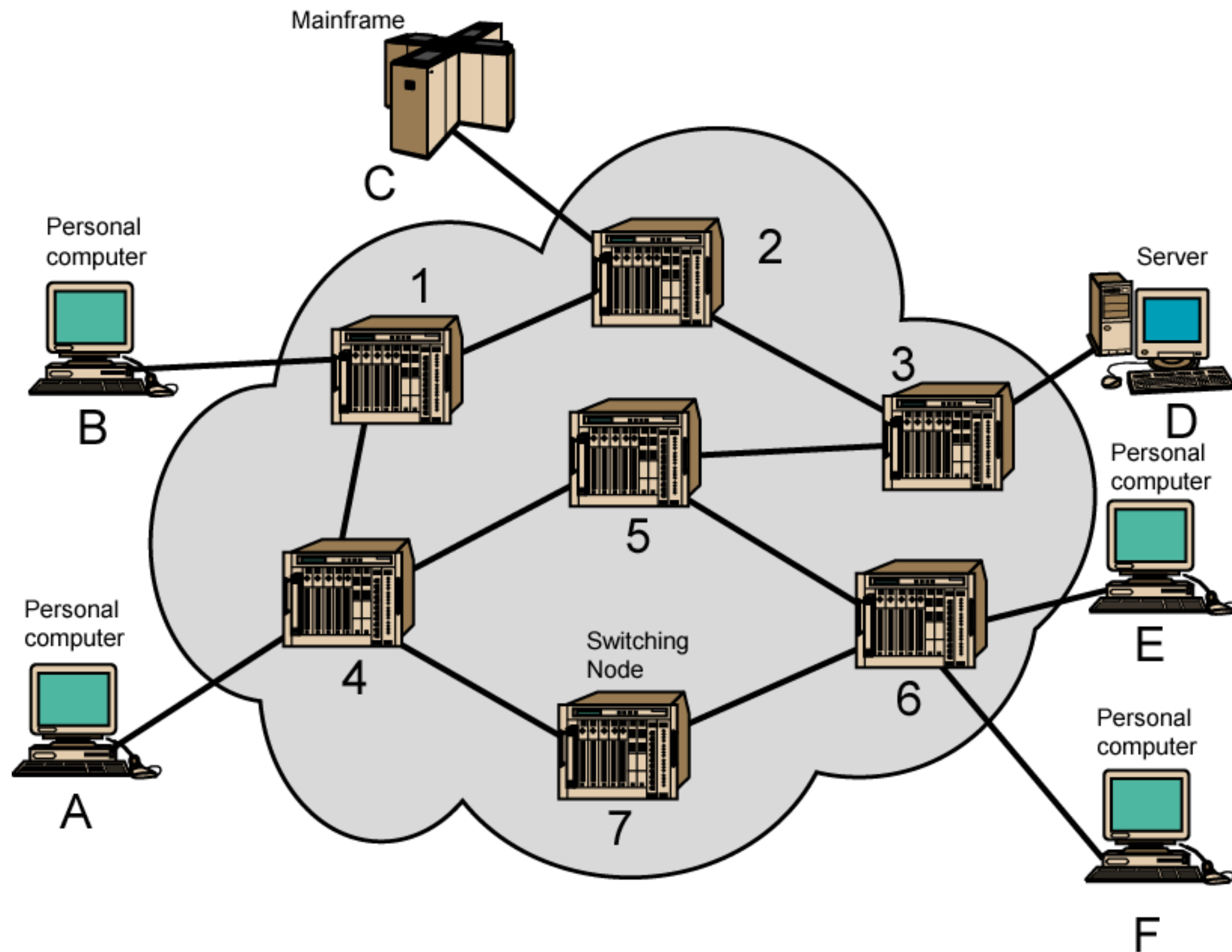
SWITCHING NODES

- Nodes may connect to other nodes, or to some stations.
- Network is usually partially connected

However, some redundant connections are desirable for reliability

Two different switching technologies

- Circuit switching - *Electronic switches are used*
- Packet switching- *1970's concept revolutionized data communications*

▪ Provides the basis for the modern Internet
▪ Allows multiple users to **share** a network
▪ Divides data into small blocks, called **packets**
▪ Includes an **identification** of the intended recipient in each packet
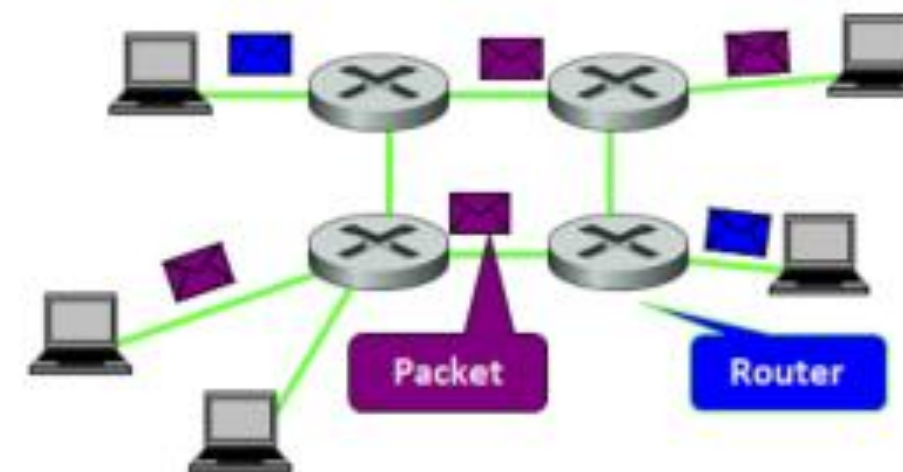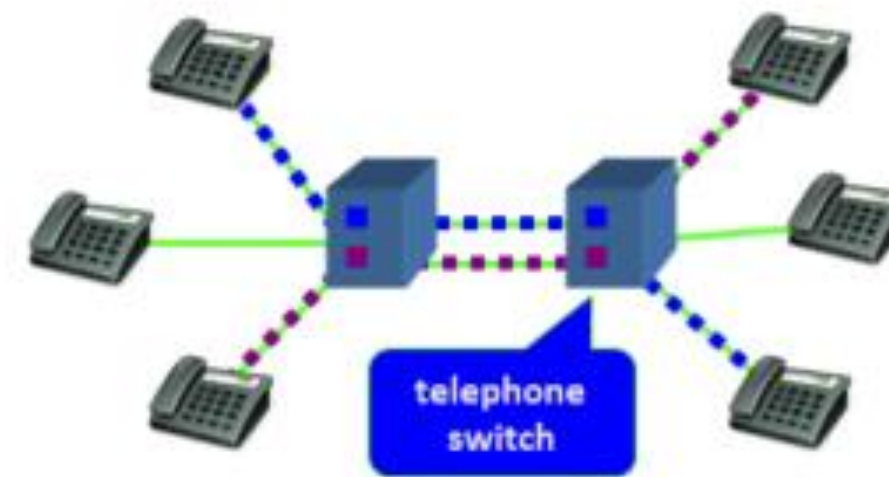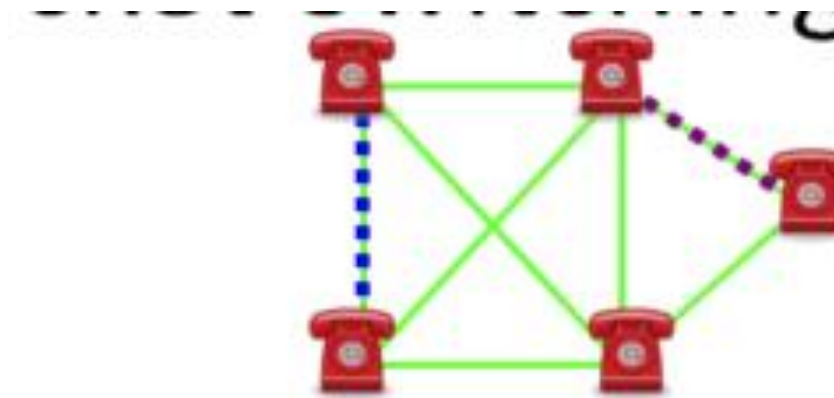
Dedicated circuits
Circuit switching
- Telephone switches
  establish circuits
  for communication

CIRCUIT SWITCHING

Circuit switching:
- There is a dedicated communication path between two stations (end-to-end)
- The path is a connected sequence of links between network nodes. On each physical link, a logical channel is dedicated to the connection.

Communication via circuit switching has three phases:
- Circuit establishment (link by link)
      Routing & resource allocation (FDM or TDM)
- Data transfer
- Circuit disconnect
      Deallocate the dedicated resources
- The switches must know how to find the route to the destination and how to allocate bandwidth (channel) to establish a connection.

CIRCUIT SWITCHING PROPERTIES

Inefficiency
- Channel capacity is dedicated for the whole duration of a connection
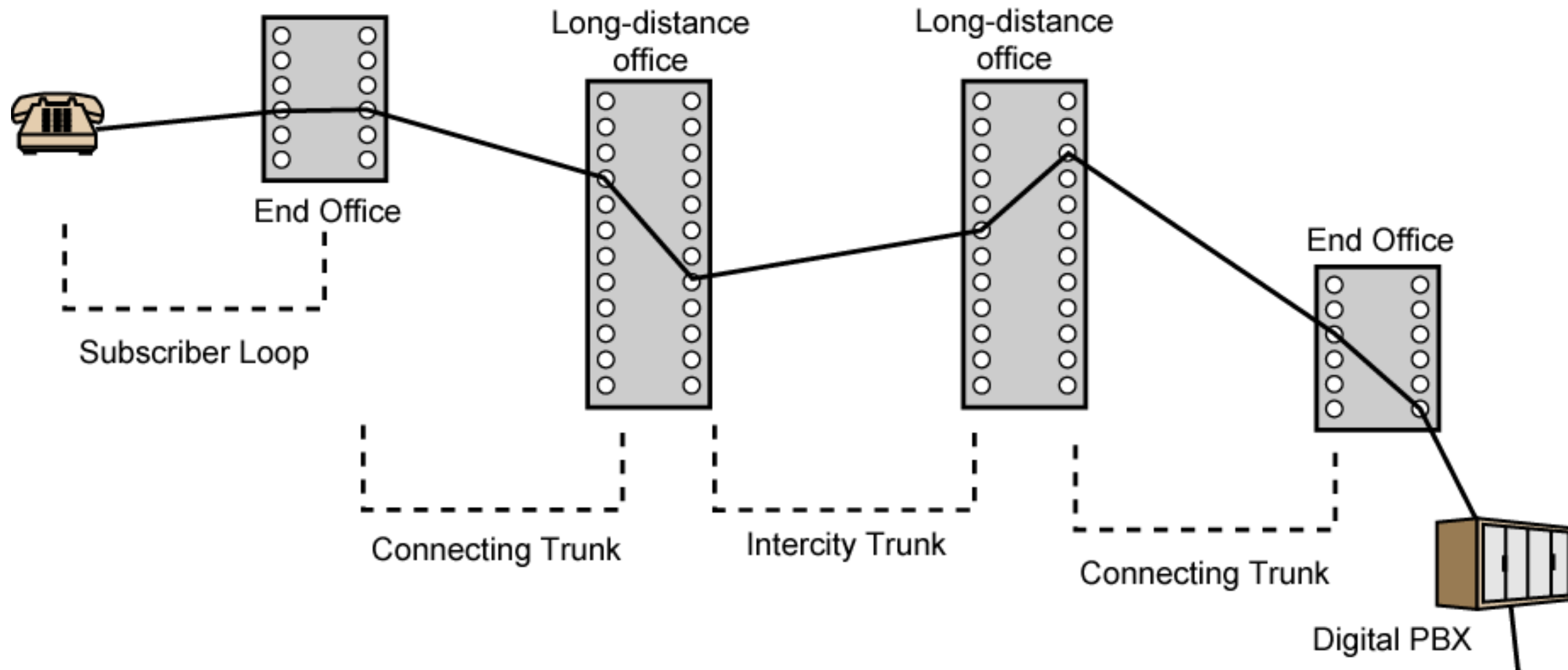- If no data, capacity is wasted

Delay
- Long initial delay: circuit establishment takes time
- Low data delay: after the circuit establishment, information is transmitted at a fixed data rate with no delay other than the propagation delay. The delay at each node is negligible.

Developed for voice traffic (public telephone network) but can also applied to data traffic.
- For voice connections, the resulting circuit will enjoy a high percentage of utilization because most of the time one party or the other is talking.
- But how about data connections?

PUBLIC CIRCUIT SWITCHED NETWORK

THANK YOU